ABSTRACT

This invention provides a stable power supply apparatus enabling the high speed response. Hitherto, it was necessary to secure both of the gain margin and the phase margin on the Bode diagram of the loop transfer function when the PID feedback control was carried out in the power supply apparatus. The form of the transfer function of the controller in the power supply apparatus of this invention is the same, but a set of coefficient values in the transfer function is completely different, and the controller secures only the phase margin without securing the gain margin. Furthermore, the transfer function of the controller indicates a part with an extreme decrease in the gain and a trap point in which the phase is sharply delayed on the Bode diagram. This is achieved by applying the integral element of the PID to a frequency range that is higher than the resonance frequency of the LC filter. As a result, the high speed response becomes possible without losing the stability. Moreover, there is no case in which difficulty as to the setting of the circuit constants rises.